

# **Procedures for Performing Work in CD Computer Rooms**

(12/02/04) (CD-doc-628, version 2)

## **Personal Accountability**

Persons who work in CD Computing rooms are responsible for their actions and those of subcontractors who do work for them. These procedures and work rules have been developed to reduce the chance of mistakes and unintended events.

## **Safety**

Working safely is of paramount importance to protect yourself, others and the mission of the Computing Division. Fermilab's Integrated Safety Management and Hazard Analysis procedures have been developed in order to integrate safety into all aspects of Fermilab work. The Computing Division supports these procedures and has written a Hazard Analysis (HA) for working in CD Computer Rooms. Titled "Hazard Analysis For Working In Computer Rooms, CD-doc-627 with version 2 being the latest version, it is published on the web at:

[http://cdinternal.fnal.gov/esh/CD\\_Computer\\_Room\\_Work\\_JHA.htm](http://cdinternal.fnal.gov/esh/CD_Computer_Room_Work_JHA.htm)

and available from the Computing Division Document Database (DocDB) at:

[http://computing.fnal.gov/docdb/documents/0006/000627/002/CD\\_Computer\\_Room\\_Work\\_JHA.pdf](http://computing.fnal.gov/docdb/documents/0006/000627/002/CD_Computer_Room_Work_JHA.pdf)

## **Persons whose jobs require working in our computer rooms must read, print and sign the HA.**

Employees must submit their original signed printed HA form to our division's Senior Safety Officer (SSO). Task managers or service coordinators for subcontractors, T&M workers or others must keep subcontractor signed HA forms on file and available for review. HA's are good for 2 years. You and your supervisor will be sent email when this period lapses. Persons working in these rooms with expired HA's will be stopped.

The most frequent safety problems in our computer rooms have been the presence of combustibles, open/unseated floor tiles and incorrect use of electrical outlets. Combustibles must not be brought into the computer rooms as identified in the computer room HA. You must follow the Computer Room Open Floor Tile Work Rules at [http://cdinternal.fnal.gov/esh/floor\\_tiles.html](http://cdinternal.fnal.gov/esh/floor_tiles.html). Use of electrical for computing equipment must be arranged in advance with Computer Room Planning. For emergency work, you must provide notification by next business day.

## **Computer Room Safety Systems**

The Computing Division manages 6 computer rooms; 3 are located in the Feynman Computing Center building (FCC1, FCC1 mezzanine and FCC2), 1 in Wilson Hall on 8W known as Fiber Central, rooms 107 & 108 at LCC (Lattice Computing Center in the New Muon building) and 1 at GCC (Grid Computing Center in the Wide Band service building). These rooms are equipped with fire protection and suppression systems as required by the National Fire Protection Association's current "Standard for the Protection of Electronic Computer/Data Processing Equipment", NFPA 75, 2003 ed. For fire safety systems in each computer room, see Appendix A.

CD has additional requirements meant to prevent a fire from overheated computers. In the event that air conditioning is lost in one of our computer rooms, the heat output of the computers will cause a quick rise in room temperature resulting in lack of adequate cooling and very high temperatures of electrical components inside the computers causing a risk of fire. Thus all Farms, Grid and other large clusters of computers must self-protect against overheating, e.g., Im-sensors, IPMI code, etc. For GCC, each computer must shut down within 90 seconds on signal from our automated shutdown broadcast on the network.

### **Emergencies**

All computer rooms are equipped with smoke detectors, fire alarms with strobe lights and sprinklers. Automatic under floor halon systems are in FCC1 & 2. LCC has under floor halon which should only be activated by Fire Dept. personnel. FM200 and Inergen gas suppression systems are used in tape robots. Halon enunciators in FCC1 & 2 give audible, verbal warning of imminent discharge and a 60 second countdown. Upon hearing this warning, you should leave the area and exit the building as described in the FCC Emergency Plan [http://cdinternal.fnal.gov/esh/fcc\\_emergency\\_plan.htm](http://cdinternal.fnal.gov/esh/fcc_emergency_plan.htm). Most halon system activations have been in response to dust or dirt particles getting into the sensors when persons do work under the raised floor. If two people are present, and both are reasonably sure that the discharge warning is false due to something someone may have done to cause it, and there are no visible signs of fire or smell of smoke, you may depress and hold the halon/gas abort button/switch at a labeled location at the alarming enunciator panel until the arrival of Fire Dept. personnel who will take over holding the abort button. Otherwise, exit the building immediately.

Computer rooms have manual emergency power out (EPO) buttons located on the fire panel at each main exit. These buttons are recessed and surrounded by a collar to prevent accidental activation. Depressing one of these buttons will remove all electrical power to computers and air conditioners in the room. Uninterruptible power supplies (UPS's) will also remove power to their attached equipment. Lights will remain on and wall outlets will remain live. These buttons are labeled and should be activated **only in a life threatening emergency**, such as, visible sign of fire, electrocution, etc.

### **Computer Room Security**

ID card readers control entrances to all computer rooms. To view card reader locations and time schedules and learn about ID card validations, go to <http://cdinternal.fnal.gov/building/index.html>.

### **Computer Room Modifications**

Any work which requires a modification to a computer room must be reviewed and approved in advance. Modifications include, adding or removing computers or racks, plugging or unplugging equipment,

### **Work Rules**

1. All equipment racks must have stabilizer feet flush to the floor, wheel stops or wheel lockdowns which are tightened so that the racks cannot roll.
2. Computer rack doors should not be locked in case emergency responders need access.

3. Plugging or unplugging of computers into power outlets must be arranged with CD Data Center Management (see contact list below).
4. Tripped circuit breakers in electrical panels should not be reset. Only Building Management personnel should reset them.
5. Do not set items on top of equipment or block access of any aisles, doors, air conditioning units, electrical or fire panels. Do not run wires or cables on top of the floor across an aisle.
6. Use safety cones and plastic chain as outlined in Computer Room Open Floor Tile Work Rules [http://cdinternal.fnal.gov/esh/floor\\_tiles.html](http://cdinternal.fnal.gov/esh/floor_tiles.html) to direct people away from hazardous areas. Floor tiles must be replaced at the end of each day's work.
7. Floor tile pullers for both solid and vented tiles are located at the computer room main exit doors. Use of stand-up of floor tile pullers for solid tiles is preferred to save on back/arm strain. Pullers must be returned when finished.
8. All computer equipment must be unpacked outside of computer rooms. Boxes and packing materials are not allowed in computer rooms. If this is not possible, arrangements must be made in advance with Building Management.
9. Nothing shall be stored under the computer room raised floor.
10. When working under the raised floor, cables, fire detectors, water leak detection wires and other subfloor devices and equipment must not be disturbed. If this is not possible, contact Data Center Planning.
11. No flammables of quantity greater than 1 pint should be brought into the computer room without the approval of the CD SSO. Flammables must be removed at the end of each workday and stored in a flammables cabinet.
12. Moves of equipment over 300 lbs across a computer room floor must be arranged in advance with Building Management.
13. Depending on the type of work done, personal protective equipment, such as, safety shoes and/or glasses may be required. Supervisors must make the judgment and it should be part of the job HA, whether verbal or written. Under no circumstances will bare feet be allowed.

### **Contact List**

<b>Function</b>	<b>Phone</b>	<b>Name</b>	<b>Email/Web Form</b>
SSO	8493	Amy Pavnica	<a href="mailto:pavnica@fnal.gov">pavnica@fnal.gov</a>
Data Center Planning	5159	Phil Lutz	<a href="mailto:phillutz@fnal.gov">phillutz@fnal.gov</a>
Building Management	2865 3537	Jack MacNerland Mark Thomas	<a href="mailto:jak@fnal.gov">jak@fnal.gov</a> <a href="mailto:mthomas@fnal.gov">mthomas@fnal.gov</a>

If unable to contact any of the above, call Gerry Bellendir, x3930, [gerryb@fnal.gov](mailto:gerryb@fnal.gov)

## Appendix A

### **Computer Room Fire Safety Systems**

<b>Emergency Systems</b>	<b>FCC1</b>	<b>FCC2</b>	<b>FCC1tape vault</b>	<b>FCC1 mezzanine</b>	<b>WH8W “Fiber Central”</b>	<b>LCC</b>	<b>GCC</b>
Smoke detectors	Above & below floor	Above & below floor	Ceiling	Ceiling	Above & below floor	Above floor	Above & below floor
Fire Alarms & Strobes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Halon	Automatic under floor	Automatic under floor	Automatic above floor	No	No	Manual under floor	No
Sprinklers	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Emergency Power Out	Automatic & Manual	Automatic & Manual	Automatic	Automatic & Manual	Automatic & Manual	Automatic & Manual	Automatic & Manual
Fire Rated Doors	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Emergency Lights	Yes	Yes	Yes	Yes	Yes	Yes	Yes

The ADIC and STK tape robots in the FCC2 computer room and the STK tape robots in the FCC1 Mezzanine each have an internal gaseous fire suppression system installed.